
Question 6:

6 points

- A. Use Heun's method (2RK) to approximate the solution of the following differential equation at $y(2.4)$ with step size ($h=0.2$)

$$x \frac{dy}{dx} = 3x + 2y \quad y(2) = -2$$

- B. If the solution of the differential equation is $y = x^2 - 3x$ calculate the relative error with respect to true value.

Question 7: Solve the following questions (**show your solution steps**).

6 points

- A) Find the number of significant digits which x_i is correct for $x_i=0.759$ with absolute error at x_i is 0.0034.
- B) Find the inverse of $A = \begin{bmatrix} 0.5 & 0.625 \\ 0.2 & 0.75 \end{bmatrix}$.
- C) Find the Eigen values of $A = \begin{bmatrix} -3 & 2 \\ 1 & -4 \end{bmatrix}$
- D)
- E) If $\frac{dy}{dx} = \frac{2y}{x}$ and $y(1) = 4$ then approximate $y(1.5)$ using Euler method with step size $h = 0.5$